

LOCAL GOVERNMENT
BULLETIN 40

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**ENERGY CONSERVATION
IN
ONTARIO MUNICIPALITIES**

Ontario Ministry of Intergovernmental Affairs

Hon. Thomas L. Wells
Minister

D.W. Stevenson
Deputy Minister

Local Government Division
Municipal Administration Branch


July 1980

To the Municipal Clerk:

Please circulate this bulletin or make copies for distribution to councillors or staff of your municipality who may be interested in the subject. Additional copies are available at a dollar each from the Publications Centre (see page 21).

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INTRODUCTION

"There is a whole new energy source, one that we've only started to tap. It's cheap. It's powerful. It's abundant and easily accessible. I am referring to conservation energy."

"Conservation can be Ontario's biggest contribution to solving our country's energy problem. Its source is within ourselves, in the way we think about the things we do everyday."

The Honourable Robert Welch, Minister of Energy, was making the point that we can solve our energy problems, when he delivered those words on March 13, 1980. Our insatiable appetite to consume energy, all forms of it, led to our problems. Since we created those problems, we also have the ability within us to solve those problems. However it happened, the energy crunch is very real.

No longer can we be assured of an abundant supply of cheap energy, whether it be oil, gasoline, natural gas, electricity or any other form. The line-ups at the gasoline pumps and the shortages experienced in the United States last year are expected to return again this year. The same experience could happen in Canada, even though we have been able to avert it so far. To help overcome this problem, everyone is asked to conserve energy.

Municipalities also have a stake in minimizing their energy consumption. Since it has been estimated that between 8% and 12% of their property-tax revenue is spent on energy -- to heat, air-condition and light municipal buildings, light streets, operate water and sewage-treatment plants, operate municipal vehicles and equipment -- the magnitude of the expense to municipalities can be better understood, and as the cost of energy increases, the effect on the municipality becomes even more acute.

Billboards emphasize the need for energy conservation. Our utility companies put energy conservation notices in our monthly bills. Advertisements in periodicals and newspapers outline the advantages of conservation. Our radio and television stations often have programs or announcements that urge us to conserve.

In our personal lives, too, we are asked to insulate our homes, drive our cars less, drive smaller and more gasoline-efficient cars, lower the temperature in our homes at night, as well as shut off lights in rooms that are not used.

How can municipalities do their part in conserving energy? Some measures are obvious, easy to do and require little if any expense. Others require further study and a possible capital expenditure to implement, even though the payback period may be only a few years. Consider the following ideas (all are currently being implemented in Ontario municipalities) and see if any of them could be applicable to your situation.

- a) Shut off or turn down lights, furnaces, air conditioners, etc. during unoccupied periods of time.
- b) Establish night set-back temperatures.
- c) Generally reduce the level of lighting.
- d) Install controls on snow-melting systems in order to optimize their use.
- e) Build a second doorway, inside the first, to cut down on heat loss when outside doors are being opened and closed.
- f) Make an energy audit of your building. (You can't solve the problem until you know the size of it).

Some of these ideas are easier said than done. But many of them can be implemented without any increase in cost -- it only requires some attention.

This bulletin will outline the energy programs of three municipalities in Ontario. There are, no doubt, other municipalities that have well-established programs, but are not used as examples. To these, the bulletin may not be as important as to those who do not have a program. The experience of Burlington, Brockville and Sarnia, therefore, could be used as the catalyst to start your own municipal energy-conservation

program. In fact, each of these municipalities is willing, and indeed pleased, to assist any municipality with its program. Just give them a call.

This bulletin does not highlight the Energy Conservation program in the Regional Municipality of Durham because it was exceedingly well documented in a publication produced by the Ministry of Energy. However many municipal programs were patterned after the initiatives in Durham and for this reason recognition should be given to them. Along with the three municipalities highlighted in this bulletin, Durham would also be pleased to assist any municipality with its program.

JOINT STEERING COMMITTEE
ON ENERGY CONSERVATION

In January, 1979, the Provincial-Municipal Steering Committee on Energy Conservation was formed, following an appeal by the Minister of Energy, The Honourable James Auld, to the Municipal Liaison Committee (M.L.C.). The M.L.C. designated the Association of Counties and Regions of Ontario (A.C.R.O.) as its representative on the Joint Steering Committee. Co-Chairmen of the Committee are Walter Beath, Chairman of the Regional Municipality of Durham, and Dr. Ian Rowe, Assistant Deputy Minister, Conservation and Renewable Energy Group of the Ministry of Energy.

The Committee meets regularly to discuss programs that may either be of interest to municipalities or that the Ministry should be involved in to assist municipalities to carry out an effective energy-conservation program.

All municipalities in Ontario were sent a letter in March, 1979, by the Committee requesting their participation in a voluntary energy-conservation program and asking them to name an energy co-ordinator to serve as liaison between the municipality and the Committee. Nearly 150 municipalities have responded positively to date by naming an energy co-ordinator. These municipalities have already received a Municipal Energy Conservation Manual that contains information designed to be helpful in developing a program suitable for their circumstances. As new information is available, it is shared with the co-ordinators.

Information on how to be involved in this program may be obtained either from A.C.R.O. or the Ministry of Energy at these addresses:

Mrs. Barbara J. Hume-Wright, M.Sc.
Program Co-ordinator
Municipal Conservation Energy Program
Association of Counties and Regions
of Ontario
Suite 501
100 University Avenue
Toronto, Ontario
M5J 1V6
(416) 593-1477

Mr. Walter Chick, P.Eng.
 Technical Adviser
 Conservation and Renewable
 Energy Conservation Group
 Ministry of Energy
 11th Floor
 56 Wellesley Street West
 Toronto, Ontario
 M7A 2B7
 (416) 965-3051

HOW TO APPROACH AN IDEAL
ENERGY-CONSERVATION PROGRAM

The Ministry of Energy has outlined a series of steps that can be followed by any municipality in establishing its energy-conservation program.

At the outset, a commitment from Council to an energy-conservation program is needed. After the commitment the program begins with the appointment of an energy co-ordinator and with the establishment of a special energy-management committee. Although the establishment of the committee and the appointment of the co-ordinator may be more applicable to the large municipality, the smaller ones may only wish to make one person responsible for energy co-ordination.

The committee should have every department in the municipality represented. The individuals selected to the committee should ideally be those who are in a position to affect departmental decisions and policy.

The committee's first task should be to collect basic data on energy use, review building operations and maintenance practices, identify specific opportunities for energy savings and set targets.

After the data collection is complete, implementing energy-conservation measures usually occurs in three phases.

Phase one involves those which save energy without any capital outlay -- such as lowering thermostats, removing unnecessary lighting or lowering lighting levels in non-working areas such as hallways and washrooms, and improving the operating efficiency of furnaces. Savings of 25 per cent or more could be achieved in some instances. In addition, savings of at least 10 per cent could be realized through more efficient vehicle operations.

Phase two involves spending a little money on measures that pay for themselves in about 1½ to 3 years. These include upgrading building insulation, installing automatic timing devices on heating and lighting circuits and

replacing incandescent lighting with more efficient lamps.

Phase three covering a longer term, includes major building renovations and waste-heat-recovering installations. Payback period for these can run between five and ten years.

In addition, the Energy Co-ordinator or the Committee can review the Official Plan and by-laws dealing with zoning, property standards, development control and building codes to identify opportunities for savings in these areas and to make suggestions for their revision within the existing legislative framework.

Further, the Energy Co-ordinator or the Committee can examine plans of subdivision and urban transportation system to make recommendations to the appropriate bodies concerning energy conservation in these areas.

EXPERIENCE OF THE
CITY OF BURLINGTON

Prior to the formal establishment of the Energy Conservation Committee, the City had already authorized the hiring of a consultant to do an energy audit study of the 37 municipal buildings in the City. The study, which was carried out under the guidance of the Public Works Department, was the catalyst that sparked the establishment of the Committee, primarily at the initiative of the Chief Administrative Officer and the Department Heads.

Its terms of reference were very simple and direct - "to implement various methods of energy conservation for municipal buildings and equipment, then install a savings program using 1978 energy requirements as the base year." Although the terms of reference were primarily building-oriented, a full program would have to be established to ensure that energy conservation became a "way-of-life" at all city facilities among the staff.

In order to implement a comprehensive program, nearly every Department had to be represented on the Committee. In Burlington there are two from Parks and Recreation, two from Public Works, one from Planning, one from Treasury, one from the Clerk's office, one from Personnel and one from the Fire Department. These departments would enable a co-ordinated effort to be achieved when implementing any program of energy conservation. The Committee reports to the Management Committee, which is the senior staff committee responsible for co-ordinating all city programs.

At the outset the Committee met weekly to set up both short-term and long-term goals, assign responsibilities and eventually set out a program. Recently it has only been meeting monthly, primarily to monitor the program as established.

Its initial task was to build up a body of information on energy conservation. It contacted the Ministry of Energy, Ontario Hydro, the local Public Utilities Commission and the gas company. These organizations were invited to attend their

meetings and outline how they might become involved in assisting the City to carry out its program.

The Committee then established its goals, both short-term and long-term. Its short-term goals are:

- a) to reduce energy consumption from June 1, 1979 to June 1, 1980 by 10% compared to the previous year's consumption;
- b) to improve the efficiency of energy use;
- c) to control costs as energy prices escalate;
- d) to promote energy conservation at work and at home;
- e) to ensure that energy-conservation suggestions are channelled through the Energy Conservation Committee prior to implementation.

Its long-term goals, on the other hand, are:

- a) to require the design of all proposed municipally-financed projects to comply with energy-efficient standards, including the investigation of computerized building-management system;
- b) to implement a review of possible capital works for buildings and equipment, to improve energy efficiency of existing facilities;
- c) to promote energy conservation by City staff through flyers, articles in the staff newspaper, staff awards, departmental awards and energy films;
- d) undertake an advertising program.

Once the consultant completed his report it was submitted to Council which endorsed it and referred it to the Committee to implement the recommendations. This report, which Burlington felt was an excellent start to any concrete program, investigated and noted the existing energy consumption in the three fire halls, the Civic Operations Centre, the Bus Terminal, the

Animal Shelter and 31 recreation facilities such as the arenas, pools and golf course. This report divided the recommendations for reducing energy costs as well as conserving energy into three parts, one involving no cost and the other two involving progressively more cost. The Committee and subsequently Council would then be able to take the recommendations into the city budgetary process and relate the recommendations to the overall spending priorities of the City. Many of the recommendations, when implemented, would result in immediate savings of approximately 10% of the current energy bill, without any appreciable change in the comfort level for the users of the buildings. However, to effect the recommendations fully and to obtain staff involvement in the implementation meant that an in-service program to inform the staff had to be established. Although nearly all the staff were aware that an energy committee had been established, they were not fully aware of its work and what may be asked of them.

Much of this was overcome by the setting aside of an Energy Conservation Week in the City. During this week films on energy were shown, presentations on energy conservation made and displays set up. Pamphlets from the gas and hydro companies were distributed to each employee with their paychecks. A memo, signed by the Mayor was circulated to the staff extolling the virtues of energy conservation as well as urging the staff to become involved by suggesting ways to cut down energy consumption. The senior staff members, by way of example, were consciously striving to minimize consumption in their own areas. Also, simple ideas on how to implement energy-conservation measures at home were given to the staff. All of this with the prime intent of trying to make energy conservation a "way-of-life" in the City administration.

Albeit that Conservation Week was a concentrated effort, the impact will be carried on by the Committee. A column in the staff newspaper will be devoted to energy-conservation articles. Special recognition will be given monthly to the employee who contributed most to energy conservation that month. Reminders concerning conservation will be posted throughout the City buildings. Buttons and stickers will be distributed to staff periodically. Although

the City is very serious about its energy-conservation program, the Committee feels that the key to its success lies in the commitment of its staff.

The effort of the Committee and the various changes it has initiated are being constantly monitored to break out statistics on energy consumption for each facility. The members of the Committee derive a very real sense of satisfaction when they review the monthly figures and see the improvement over the previous year.

The future efforts of the Committee will be to look at not only other areas where conservation can be achieved but also some longer-term procedures that will enable the City to manage energy consumption better. The use of city vehicles will be an area to look at; also, the use of the city computer to monitor energy use. Whether the City is ready for an energy coordinator on staff is another consideration of the Committee. These are only some of the ideas the City is currently entertaining.

For more information please contact:

Mr. Art Mushlian
Superintendent of Recreation Facilities
Department of Recreation Services
The City of Burlington
Upper Canada Place
460 Brant Street
P.O. Box 5013
Burlington, Ontario
L7R 3Z6
(416) 335-7714

ENERGY CONSERVATION IN
THE CITY OF BROCKVILLE

Although energy conservation activities in the City of Brockville had been going on in some of the City Departments for some time, it was not until May, 1979, that a co-ordinated approach took place with the creation of the Energy Conservation Committee. Membership on the Committee was from every Department in the City and this was to ensure that every Department would be aware of, and could uniformly implement, any of the recommendations of the Committee.

The first step taken by the Committee, as in the case of Burlington, was to build up a body of knowledge before any concrete programs would be established. Members of the Committee contacted the P.U.C., Ontario Hydro, the gas company, and the Ministry of Energy to get their ideas, and also attended seminars on energy conservation. However, they got their main impetus from contacting two municipalities, namely the Regional Municipality of Durham and the Regional Municipality of Waterloo. Since these two municipalities had fairly well-established programs, Brockville was able to learn from their experiences, as well as obtaining copies of their goals and programs. This background information enabled the Committee to establish a firm base from which to carry out the work.

The Committee's first undertaking was to identify and assign responsibilities to the Committee members. They identified the following areas in which to concentrate their effort -- lighting, heating, air conditioning, insulation, solar energy, vehicle equipment and fleet fuel consumption, street lighting, cost records and energy accounting, advertising and employee suggestion plans, and new-technology monitoring. Each of the members was asked to research his area of responsibility and report progress at each monthly meeting.

While the Members were researching their areas of responsibility, the Committee worked on the preparation of short-term and long-term goals that would form the cornerstones of the City's

energy-conservation program. This was completed, but only after several meetings since the members knew that a well-thought-out set of goals would make their task easier. Copies of these goals are available from the City.

The Committee divided the work into two parts, those that could be done in-house and those that required professional assistance from outside. As an example of the in-house work, a report on the lighting levels of City Hall offices and hallways was done. This report not only recorded the existing levels, but also suggested new reduced levels that could be implemented. The report also suggested that the number of incandescent light fixtures could be replaced with single florescent light fixtures. A three-week test period in the Recreation and Personnel offices using the new reduced lighting levels was instituted without any complaints from staff and no noticeable reduction in productivity. The report, recommending the new lighting levels, was approved by the Committee, submitted to the Chief Administrative Officer and approved by him. The report showed that in the first year a saving of \$1,500 would also be realized. Similar investigations are being instituted in each of the other municipally-owned buildings and the savings are expected to match, if not exceed, those experienced in City Hall.

In fact, the Brockville City Library, using the same criteria on lighting reductions, realized a reduction of 16% in its kilowatt usage in the six months (August, 1979 to April, 1980) from the same time the year before.

Preliminary recommendations concerning the city fleet have also already been made. As vehicles are to be replaced, smaller and more gasoline-efficient ones will be purchased. The City's half-ton trucks, which are equipped with 8-cylinder engines, will be replaced by three-quarter-ton trucks with 6-cylinder engines. These trucks will give the same payload power at less fuel and maintenance costs. Similarly the foremen's vehicles as well as the animal-control and parking-meter-maintenance vehicles will be replaced by smaller-type pickup vehicles as needed.

In fact, by installing an energy consciousness in the employees using the city fleet, 10,000 fewer gallons of gasoline were consumed during 1979 than during 1977. This was in spite of an increase in the overall fleet during that two-year period.

All records on the consumption and cost of energy for each facility is being maintained by the Treasury Department. Tables and graphs showing the cost and consumption is prepared monthly on each facility and sent to the appropriate Department Head, not only to show what the costs actually are but also to encourage the Department to become energy conscious and take the necessary steps to improve the situation. The forms from the City of Mississauga (included in this bulletin as an Appendix) are being used for this purpose.

As an example of assistance from outside, the Committee felt that it needed to retain a consultant in completing an in-depth energy audit of City Hall. The consultant's report examined all the energy-consuming functions of City Hall, analyzed the findings and recommended appropriate retrofit measures, including the cost-benefit for these changes. It is estimated that if all of the recommendations of the report were to be implemented, a saving of nearly \$6,000 per annum could be achieved, with a decrease in energy consumed of 52% from the current level. The City is using this report in budgeting for the implementation of the recommendations for the next few years.

The Committee continues to meet monthly. Its work is not done but its efforts so far have made a significant impact on the energy consumed by the City. Staff are becoming aware of this activity and are pleased to see City Hall "doing its part" in energy conservation in Brockville.

For further information please contact either:

Mr. Tom Dobbin
City Engineer
City of Brockville
Victoria Hall
Brockville, Ontario
K6V 3P5
(613) 342-8772

- or -

Mr. Trevor Scott
Administrative Assistant
City of Brockville
Victoria Hall
Brockville, Ontario
K6V 3P5
(613) 342-8772

CITY OF SARNIA
PRODUCTION OF SLUDGE GAS FROM THE
OPERATION OF A PRIMARY SEWAGE TREATMENT PLANT

The City of Sarnia has had its primary sewage treatment plant in operation since 1961. It is similar to those designed to serve communities of between 50,000 and 100,000 people. One significant difference, however, is the fact that this system treats domestic and municipal waste but only a small amount of industrial waste since many of the large chemical plants, which make up the majority of the industry, have their own independent treatment facilities.

The plant was originally designed to treat eight million imperial gallons of sewage per day. However, it has recently received a new rating from the Ministry of the Environment increasing its allowable treatment capacity to fourteen and one-half million gallons per day. Currently it is operating at nine million gallons per day.

This plant has three digesters that treat the sludge which has been separated from the water. During the operation of the digester, sludge gas is produced. This gas contains methane but does not have the BTU content of natural gas. Nevertheless, it has sufficient energy to be collected and used, most of the time to run the engines that drive the main pumps and part of the time to supply the boilers. Sarnia has been able to collect enough of the gas that it is estimated that 75% of the gas required annually to operate the engines and the boilers is supplied by the sludge. This saving to the City has been estimated to be \$58,000.00 per year. The system, when it was installed, was estimated to produce 64,000 cubic feet of gas per day. However, through increased flows and sludge production over the years, each of the two digesters can produce 60,000 cubic feet of gas per day, for a total output of 120,000 cubic feet.

The City also has other energy-saving systems at the plant. One relates to the heat generated by the operation of the engines and the other to the operation of the settling tanks' sludge collectors.

The heat generated by the operation of the engines is captured and used to help heat the

digesters year-round as well as the buildings in the winter. Not only has there been no discomfort to the maintenance staff but, more important, a saving in energy consumption has been realized.

At the outset, the small motor that drives the sludge collectors in the settling tanks used to operate continuously. The sludge collectors collect the sludge from the bottom of the settling tanks. It was found that sludge collectors could be operated for only five hours per day and virtually the same productivity could be achieved as if it operated continuously. This operating change not only saves energy, but reduces the wear and tear on the collector mechanism. In winter the sludge collectors had to be operated continuously or the chain gears would freeze up. However, recently the staff installed a skirt to surround the gears and permit the heat from the sewage to keep the gears from freezing. This solved the problem and allowed the collectors to operate only five hours a day year-round.

To further try to save energy, consideration is being given to use the sludge gas to operate a generator to produce some of the electricity used in the plant. This is only in the initial investigation stage but shows the interest the City has to conserve as much energy as possible.

For further information, please contact:

Mr. Donald W. Silliman, P.Eng.
Commissioner of Works
City of Sarnia
255 N. Christina Street
Sarnia, Ontario
N7T 7N2
(519) 332-0330 Ext. 279

- or -

Mr. Jack Burns
Superintendent
Water Pollution Control
c/o City Hall
255 N. Christina Street
Sarnia, Ontario
N7T 7N2
(519) 344-8507

CONCLUSION

The energy-conservation activities described in Burlington, Brockville and Sarnia are only three of a number of municipalities that are currently pursuing energy conservation. In fact, the Ontario Government, primarily through the Ministry of Energy, is currently involved in more than 100 projects, many involving municipalities. Some of these projects are:

- . ways to improve existing street lighting with energy-efficient lighting units.
- . guidelines for energy conservation in existing skating rinks and arenas and design criteria for new arenas.
- . evaluation of a wind/diesel generator for use in isolated northern communities.

Although these and other projects can assist a municipality, the key and most important ingredient in any program is the commitment from the staff. Motivation, interest and dedication of the staff to conserve energy in their own homes as well as in the municipality's installations is essential in order to ensure that energy conservation becomes a "way-of-life" in Ontario.

APPENDIX
CITY OF MISSISSAUGA
ENERGY CONSERVATION FORMS

The following four (4) forms are used by the City of Mississauga to monitor its energy-conservation program. The City has given permission for any municipality to reproduce these forms and use them for its own purposes.

Form 1 - (Copy reduced from 8½" x 14" actual)

This form was used to gather historical energy consumption data, by month, back to 1977 in order to establish a fair base level. It is used to record current consumption monthly in dollars and units. The information is taken from actual bills paid.

Form 2

Using the historical data gathered, a base energy figure in units was determined for each building -- in most cases, the average of the years 1977 and 1978. The conservation target for 1979 was 90 per cent of the base. This form is used to convey the base and target for each building and facility to the Department Head. The target for 1980 is 80 per cent of the base.

Form 3 - (Copy reduced from 14" x 20½" actual)

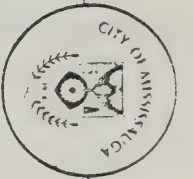
The information gained from Form 1 is transferred to this form and compared to base and target. This information is not circulated but is kept by the Energy Co-ordinator. It is the work sheet on which quarterly reports are based.

Form 4

Quarterly performance reports are circulated by the Energy Co-ordinator to Department Heads. This form shows each Department Head, building by building, how he is doing relative to the target set for him by City Council.

Additional information on their use may be
obtained from:

Mr. William E. Hodgson, P.Eng.
Co-ordinator of Energy
Conservation
City of Mississauga
Building Department
1 City Centre Drive
Mississauga, Ontario
L5B 1M2
(416) 279-7600 Ext. 4444



ENERGY CONSUMPTION READINGS

YEAR CONSTRUCTED
 HEIGHT (No. of Floors)
 GROSS SQ. FT. AREA
 (Including Basement)
 BUILDING NUMBER
 DEPARTMENT
 BUILDING NAME
 ADDRESS
 PAGE NUMBER

MONTH 19__	ELECTRICITY			OIL		GAS		WATER		REMARKS <small>NOTE ANY CHANGES TO BUILDING OR CONDITIONS WHICH WOULD AFFECT CONSUMPTION OF ENERGY.</small>
	CONSUMPTION KWH	DEMAND \$	TOTAL \$	CONSUMPTION GALS.	\$	CONSUMPTION CU. FT.	\$	CONSUMPTION K. GALS.	\$	
JAN.										
FEB.										
MAR.										
APR.										
MAY										
JUN.										
JUL.										
AUG.										
SEP.										
OCT.										
NOV.										
DEC.										
TOTALS										



22
Energy - Consumption Budget

Date _____

For the period Jan.1 19__ to Dec. 31 19__

Department _____

Bldgs. this page _____

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				

	1977 ACTUAL	1978 ACTUAL	1979 BASE (AVG. 77-78)	1979 BUDGET 90% BASE
ELECTRICITY (KWH)				
OIL (GALLONS)				
GAS (100 CU. FT.)				
WATER (GALLONS)				



ENERGY CONSUMPTION ANALYSIS 19

ELECTRICITY (KWH)

REPORTING PERIOD	A 1977 ACTUAL	B 1978 ACTUAL	C 1979 BASE (A+B/2)	D 1979 TARGET (90% C)	E 1979 ACTUAL	F VARIATION ACT vs TARGET	G VARIATION ACT vs BASE	H **COST EFFECTIVENESS
						OVER UNDER	OVER UNDER	OVERAGE SAVING
JAN FEB MARCH								
1st QUARTER								
APRIL MAY JUNE								
2nd QUARTER								
YEAR-TO-DATE								
JULY AUGUST SEPT								
3rd QUARTER								
YEAR-TO-DATE								
OCT NOV DEC								
4th QUARTER								
TOTAL YEAR								

SUMMARY ANALYSIS - ELECTRICITY - OIL - GAS (EQUIV. KWH)

REPORTING PERIOD	A ELECTRICITY ACTUAL KWH	B OIL ACTUAL (EQUIV - 45.41 x B)	C OIL EQUIV. KWH	D GAS ACTUAL (EQUIV - 29.3 x D)	E GAS EQUIV. KWH	F *TOTAL BASE	G TOTAL ACT (90% E)	H TOTAL ACTUAL (A + C + E)	I VARIATION ACT vs TARGET	J VARIATION ACT vs BASE
						EQUIV. KWH	EQUIV. KWH	EQUIV. KWH	OVER UNDER	OVER UNDER
JAN FEB MARCH										
1st QUARTER										
APRIL MAY JUNE										
2nd QUARTER										
YEAR-TO-DATE										
JULY AUGUST SEPT										
3rd QUARTER										
YEAR-TO-DATE										
OCT NOV DEC										
4th QUARTER										
TOTAL YEAR										

SUMMARY	COST
EFFECTIVENESS	ELECTRICITY
OVERAGE	SAVING

OIL (GALLONS)

GAS (100 CUBIC FEET)

REPORTING PERIOD	A 1977 ACTUAL	B 1978 ACTUAL	C 1979 BASE (A+B/2)	D 1979 TARGET (90% C)	E 1979 ACTUAL	F VARIATION ACT vs TARGET	G VARIATION ACT vs BASE	H **COST EFFECTIVENESS
						OVER UNDER	OVER UNDER	OVERAGE SAVING
JAN FEB MARCH								
1st QUARTER								
APRIL MAY JUNE								
2nd QUARTER								
YEAR-TO-DATE								
JULY AUGUST SEPT								
3rd QUARTER								
YEAR-TO-DATE								
OCT NOV DEC								
4th QUARTER								
TOTAL YEAR								

WATER (K GALLONS)

REPORTING PERIOD	A 1977 ACTUAL	B 1978 ACTUAL	C 1979 BASE (A+B/2)	D 1979 TARGET (90% C)	E 1979 ACTUAL	F VARIATION ACT vs TARGET	G VARIATION ACT vs BASE	H **COST EFFECTIVENESS
						OVER UNDER	OVER UNDER	OVERAGE SAVING
JAN FEB MARCH								
1st QUARTER								
APRIL MAY JUNE								
2nd QUARTER								
YEAR-TO-DATE								
JULY AUGUST SEPT								
3rd QUARTER								
YEAR-TO-DATE								
OCT NOV DEC								
4th QUARTER								
TOTAL YEAR								

COMMENTS

*TOTAL BASE

$$C = \left(\frac{C \times 45.41}{\text{IF FUEL IS OIL}} \right) \text{ OR } \left(\frac{C \times 29.3}{\text{IF FUEL IS GAS}} \right)$$

**COST EFFECTIVENESS

$$\left[\frac{\text{BILLED RATE}}{\text{ACTUAL CONSUMPTION}} \right] \times \left[\frac{\text{VARIATION}}{\text{(ACTUAL vs BASE)}} \right]$$

IF ACTUAL BASE SAVING IF ACTUAL - BASE OVERAGE

FILE #

FILE NAME

DEPT NAME

FILE ADDRESS

GROSS SQ. FT.



ENERGY CONSUMPTION
PERFORMANCE REPORT

DATE

FOR THE PERIOD _____ TO _____ FOR BUILDING _____

IN DEPARTMENT _____

YOU HAVE ACHIEVED YOUR TARGET. CONGRATULATIONS

YOU HAVE EXCEEDED YOUR ALLOTMENT BY _____
THIS AREA REQUIRES INVESTIGATION

ELECTRICITY	OIL	GAS	TOTAL ENERGY	WATER
KWH	GALS.	100 CU.FT.	E. KWH	K GALS.

YOUR COST EFFECTIVENESS TO DATE IN THIS BUILDING FOR ALL UTILITIES, COMPARING ACTUAL CONSUMPTION TO BASE CONSUMPTION, IS:

COMMENTS

A SAVING OF

\$

AN OVEREXPENDITURE OF

\$

SIGNATURE ENERGY COORDINATOR

DETAILED BACKGROUND INFORMATION REGARDING THIS REPORT AND TECHNICAL EXPERTISE TO ASSIST YOU IN YOUR CONSERVATION EFFORTS IS AVAILABLE FROM THE ENERGY COORDINATOR AT EXTENSION
THIS REPORT WILL BE UPDATED AND ISSUED QUARTERLY.

WHITE TO DEPARTMENT CANARY RETAINED BY ENERGY COORDINATOR

This bulletin was prepared in the:

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For additional information on this subject, get in touch with any of the field officers of the Local Government Division. They are located at these addresses.

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